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April 10th.

MR. LEA, President, in the Chair.

Thirty-eight members present.

Mr. Lea remarked that he had recently received from Prof. J. Wyman specimens in alcohol of two species of *Anodonta* from the Uruguay River, South America, descriptions of the soft parts of which he had made, and intended, at a future time, to publish in the Journal at length; but he wished at present to mention that he had found a form of *Palpi* (mouth lips) different from any of the *Unionidæ* which had come under his notice from any other part of the world. The form of the *Palpi* heretofore described have always been obliquely or transversely elliptical or subtriangular, while these two species, *An. Wymanii*, Lea, and *An. lato-marginata*, Lea, are round, and the pair on either side only joined above, the edges being entirely free. It is greatly to be regretted that more or all the South American *Unionidæ* could not have been examined, as regards their soft parts, to ascertain if this difference of form of the *Palpi* should be persistently different in all the South American *Unionidæ*, or only with this member of the family—the *Anodontæ*.

April 17th.

MR. LEA, President, in the Chair.

Fifty-six members present.

The following papers were presented for publication:

"Monograph of the Genus, *Labrisomus*, of Swainson, by Theo. Gill."

"Monograph of the Genus *Labrax*, of Cuvier, by Theo. Gill."

"Monograph of the *Philypnæ*, by Theo. Gill."

"Notice of Geological Discoveries, made by Capt. J. H. Simpson, Top. Engineers, U. S. Army, in his recent explorations across the Continent."

"Catalogue of Birds collected during a survey of a route for a ship canal across the Isthmus of Darien, by order of the Government of the United States, made by Lieut. N. Michler, U. S. Top. Engineers, with notes and descriptions of new species, by John Cassin."

And were referred to Committees.

Mr. Lesley described a boulder of gneiss, eight feet high, on the summit of one of the Orange Co. highlands, in the State of New York, which was supported by four smaller rocks, so that it was lifted about a foot above the floor of nearly horizontal gneiss, forming the top of the mountain. One of these supports was a hard blue limestone, from the crust of which Mr. Lesley obtained numerous fossils, among which was probably the *Orthis costalis*, (Hall,) of the Chazy Limestone. Another block of limestone, also fossiliferous, lay not far away, and a few small pieces of a reddish sandstone like that of certain bands in the Oneida Conglomerate; but with these exceptions, there was neither drift nor diluvial stræ visible, but here and there large blocks of gneiss. The whole surface of the exposures, which were numerous and many hundred feet square, has been weathered down 2 or 3 inches, as is evident from the ridges of refractory quartz veins, which have successfully resisted the atmosphere. On this weathered surface occur what have been called the footmarks of animals; but these are nothing else than weathered-out nodules of rock more ferruginous than the rest. The locality is two miles east of Southfield Station, on the New York and Erie Railroad. Mr. Lesley and his brother were accompanied and guided to the locality by Mr. T. B. Brooks and Mr. Jenkins, two excellent local geologists and mineralogists, living in the village of Munroe.

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Dr. Leidy stated that on last Saturday, in company with Dr. Darrach, he had visited, to them, a new and rich botanical locality, which was worthy of the attention of those members interested in our local flora. This was at Jackson, N. J. about 20 miles from Philadelphia, on the Camden and Atlantic Railway. A cedar swamp, crossed by the latter, not one hundred yards from the station, contains the greatest profusion of *Saracenia purpurea*, and *Helonias bullata*, which is now in flower. Near by, they also found abundantly the *Pyxidanthra* and *Cassandra* both in flower. *Oxycoccus*, *Drosera*, etc., were also noticed. The neighboring extensive forest tract is thickly carpeted with *Gaultheria procumbens*.

Prof. W. B. Rogers communicated the result of observations which he had made within the last year on the structural and geological relations of the Albertite or so-called Albert Coal of New Brunswick.

An examination of the mine afforded, as he thought, convincing proof that this remarkable accumulation of asphaltic material could not have formed a part of the regular carbonaceous deposits of the region,—that it is not and never has been a true bed or stratum, but that it should rather be regarded as a mass collected within an irregular fissure of subsequent formation, by the distillation or infiltration of asphaltic matter from the surrounding bituminous shales.

The principal features of the deposit pointing to such an origin are—the very limited extent of the mass longitudinally traced,—its sudden and great irregularities of thickness and trend, and the yet more striking fact of its transverse direction in many parts of its course as compared with the bedding of the adjacent rocks. In the lower level at a depth of about four hundred and sixty feet where the combustible material has been removed almost entirely from end to end, the slaty rocks are seen in many places abutting against the sides of the mine at a steep angle, presenting frequently a jagged surface, such as would result from a transverse fracture and gaping of the strata. The Albertite was seen adhering to these irregular surfaces, as well in the cavities as on the projections, affording even in hand specimens excellent examples of the discordance of the mass as to position with the stratification of the contiguous rocks.

It is worthy of note that the material thus adhering to the walls of the mine has none of that intermixture with earthy sediment which so often marks the contact of regular coal seams with the enclosing strata, but maintains the same remarkable purity as in the midst of the mass. It is, moreover, quite free from the carbonaceous and rocky debris, and other marks of mechanical violence, which it must have presented had it originated in the dislocation and displacement of a coal seam originally conformable with the stratification of the neighborhood.

These evidences of the nature and origin of the deposit are confirmed by the statement that in the progress of the mining, several large fragments of the vertical wall-rock have been found detached and imbedded in the midst of the Albertite, and on one occasion a mass of unusually great dimensions could be traced by correspondence of form to a cavity in the wall at some distance above, from which it would seem to have fallen, while the contents of the fissure were still but imperfectly solidified.

The conclusions of Prof. Rogers, as to the origin and nature of this remarkable deposit are thus completely in harmony with those which Prof. Leidy has maintained on the ground of a microscopic examination of the material.

Prof. W. B. Rogers gave an account of some experiments in binocular vision, which he had devised for the purpose of testing the theory of the successive combination of corresponding points as maintained by Sir David Brewster.

In one class of these experiments two slightly inclined luminous lines were combined into a perspective resultant, either with or without a stereoscope. On looking at this intently for a few seconds, so as to induce the reverse ocular

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spectrum, and then directing the eyes towards a distant wall, a single spectrum was observed, having the attitude and relief of the original binocular resultant. When the luminous lines were regarded in succession, each by the corresponding eye, the other eye being shaded, so that no direct binocular combination could be formed, it was found on looking towards the wall that the subjective images united into a single spectral line, having the same relief as if the lines had been directly combined in the stereoscope.

In these experiments, according to the theory of Brewster, the resultant spectrum, instead of being a single line in a perspective attitude ought to present the form of two lines inclined of crossing, situated in the plane of the wall without projection or relief. The conditions of the experiments are such as exclude all opportunity of a shifting of the image on the retina, and this is essential to the successive combinations of pairs of points required by the theory in the production of perspective effect.

A similar result was still more clearly shown by vibrating a screen between the eyes and the twin pictures of a stereoscope, so as alternately to expose and cover each, completely excluding the simultaneous vision of the two. The stereoscopic relief was as apparent in these conditions as when the vibrating screen was withdrawn.

The perception of the resultant in its proper relief does not therefore require that each pair of corresponding points should be combined by directing the optic axes to them pair by pair in succession, as maintained by Brewster. Nor is it necessary for the singleness of the resultant perception that the images of corresponding points of the objects should fall on what are called corresponding points of the retina. The condition of single vision in such cases seems to be simply this, that the pictures in the two eyes shall be such and so placed as to be identical with the pictures which the real object would form, if placed at a given distance and in a given attitude before the eyes.

Dr. Ruschenberger asked how it is, under the explanation given by Prof. Rogers, that a man with only one eye is capable of perceiving solidity, and of appreciating the properties of photographs viewed stereoscopically.

Mr. Powel asked at what rate per second the vibrating or revolving screen presented its openings; for if it happened eight or ten times in a second, might it not fail to practically intercept vision? Objects thus seen would appear permanently. Thus, although not appearing to each eye at the identical instant of time, the object would be persistent in both, for an impression upon the eye cannot be discharged oftener than about eight times in a second, some impressions remain much longer. An object illuminated by a flash of lighting for a very instant, may thus appear solid to both eyes, the intense reflection impressed upon the retina endures long enough for the *sensorium* to scan it in detail. A man takes quick aim with a rifle, it may be almost instantaneously, yet by distinct operations and different foci of vision he must see the distant mark—the tip sight, and again the heel sight, no two of which can be in focus at once. We have here successive points in a line, rapidly scanned in determining position. The breadth of field of distinct vision is exceedingly narrow for the same instant of time, and so is the penetration of focus very short. A separate direction and a new adjustment of the eye must be given for parts of even a very small object.

Mr. P. remarked, while upon the subject, that he believed the stereoscopic effect often noticed in viewing large photographic pictures with only one eye, was caused by the aperture of the lens used in taking the picture; for the aperture is often so great that objects have an appreciable parallax from the opposite margins of the aperture, and the picture thus contains more than could be seen from one point. When both eyes, however, view such a picture they decide that it is flat and in one plane, and their evidence denies the stereoscopic effect which one eye cannot so well dispute.

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